

AMENDMENTS TO THE CLAIMS

1-6. (Canceled)

7. (Currently Amended) A transmitting device usable in an ultra-wideband communication system performing communications by sending repetitive pulse trains to a communication path, said transmitting device comprising:

an encoder operable to encode a k-bit information bit train to an n-bit encoded bit train at a coded rate of (k/n) ("k" is a natural number not less than 1, and "n" is a natural number not less than 2), on condition that m-piece pulses are transmitted per one bit of information bits ("m" is a natural number not less than 2) and the coded rate is (k/n) ; and

a transmitting unit operable to generate n-piece repetitive pulse trains based on the n-bit encoded bit train encoded by said encoder, thereby transmitting sequentially the n-piece repetitive pulse trains to the communication path,

wherein pulses included in the n-piece repetitive pulse trains transmitted by said transmitting unit amount to $(k*m)$ pieces in total,

wherein the n-piece repetitive pulse trains are composed by performing, in accordance with a state of the communication path, weighting on a plurality of encoded bits, the weighting being performed such that, for each of the encoded bits, a number of repetitive pulses allotted to the encoded bit is based on the susceptibility of the encoded bit to an adverse effect including interference from another user, with an encoded bit that is susceptible to the adverse effect being allotted more repetitive pulses than an encoded bit that is not susceptible to the adverse effect, thereby adaptively adjusting the number of repetitive pulses of each of the n-piece repetitive pulse trains,

wherein the repetitive pulse trains themselves constitute radio waves transmitted from an antenna,

wherein said transmitting device further comprises a transmitting control unit operable to generate control information on number of the repetitive pulses included in each train of the n-piece repetitive pulse trains transmitted by said transmitting unit,

wherein said transmitting control unit comprises a pulse generator operable, in accordance with the control information generated by said transmitting control unit, to repetitively generate a plurality of pulses for each encoded bit of the n-bit encoded bit train encoded by said encoder, thereby outputting the n-piece repetitive pulse trains, the plurality of pulses being predetermined according to a kind of each encoded bit, and

The transmitting device as defined in claim 6,

wherein said transmitting control unit is operable to transmit, as pulse train information, the number of repetitive pulses of the n-piece repetitive pulse trains generated by said pulse generator.

8. (Currently Amended) A transmitting device usable in an ultra-wideband communication system performing communications by sending repetitive pulse trains to a communication path, said transmitting device comprising:

an encoder operable to encode a k-bit information bit train to an n-bit encoded bit train at a coded rate of (k/n) (“k” is a natural number not less than 1, and “n” is a natural number not less than 2), on condition that m-piece pulses are transmitted per one bit of information bits (“m” is a natural number not less than 2) and the coded rate is (k/n) ; and

a transmitting unit operable to generate n-piece repetitive pulse trains based on the n-bit encoded bit train encoded by said encoder, thereby transmitting sequentially the n-piece repetitive pulse trains to the communication path,

wherein pulses included in the n-piece repetitive pulse trains transmitted by said transmitting unit amount to $(k \cdot m)$ pieces in total,

wherein the n-piece repetitive pulse trains are composed by performing, in accordance with a state of the communication path, weighting on a plurality of encoded bits, the weighting being performed such that, for each of the encoded bits, a number of repetitive pulses allotted to the encoded bit is based on the susceptibility of the encoded bit to an adverse effect including interference from another user, with an encoded bit that is susceptible to the adverse effect being allotted more repetitive pulses than an encoded bit that is not susceptible to the adverse effect, thereby adaptively adjusting the number of repetitive pulses of each of the n-piece repetitive pulse trains,

wherein the repetitive pulse trains themselves constitute radio waves transmitted from an antenna,

wherein said transmitting device further comprises a transmitting control unit operable to generate control information on number of the repetitive pulses included in each train of the n-piece repetitive pulse trains transmitted by said transmitting unit,

The transmitting device as defined in claim 4,

wherein said encoder outputs the n-bit encoded bit train in the form of an n-bit parallel format encoded bit train, and

wherein said transmitting unit comprises:

a pulse generator operable to repetitively generate a plurality of pulses for each encoded bit of the n-bit parallel format encoded bit train outputted by said encoder, thereby outputting n-piece parallel format repetitive pulse trains, the plurality of pulses being predetermined according to a kind of each encoded bit; and

a parallel-to-serial converter operable to convert the n-piece parallel format repetitive pulse trains outputted by said pulse generator to n-piece serial format repetitive pulse trains, thereby sequentially transmitting the n-piece serial format repetitive pulse trains to the communication path,

wherein said pulse generator determines, in accordance with the control information generated by said transmitting control unit, the number of each repetitive pulses composing the n-piece repetitive pulse trains, in such a manner that pulses included in the n-piece repetitive pulse trains amount to $(k \cdot m)$ pieces in total, and at least two pieces of the n-piece repetitive pulse trains are composed of repetitive pulses of different numbers.

9. (Currently Amended) A transmitting device usable in an ultra-wideband communication system performing communications by sending repetitive pulse trains to a communication path, said transmitting device comprising:

an encoder operable to encode a k-bit information bit train to an n-bit encoded bit train at a coded rate of (k/n) ("k" is a natural number not less than 1, and "n" is a natural number not less than 2), on condition that m-piece pulses are transmitted per one bit of information bits ("m" is a natural number not less than 2) and the coded rate is (k/n) ; and

a transmitting unit operable to generate n-piece repetitive pulse trains based on the n-bit encoded bit train encoded by said encoder, thereby transmitting sequentially the n-piece repetitive pulse trains to the communication path,

wherein pulses included in the n-piece repetitive pulse trains transmitted by said transmitting unit amount to $(k \cdot m)$ pieces in total,

wherein the n-piece repetitive pulse trains are composed by performing, in accordance with a state of the communication path, weighting on a plurality of encoded bits, the weighting being performed such that, for each of the encoded bits, a number of repetitive pulses allotted to the encoded bit is based on the susceptibility of the encoded bit to an adverse effect including interference from another user, with an encoded bit that is susceptible to the adverse effect being allotted more repetitive pulses than an encoded bit that is not susceptible to the adverse effect, thereby adaptively adjusting the number of repetitive pulses of each of the n-piece repetitive pulse trains,

wherein the repetitive pulse trains themselves constitute radio waves transmitted from an antenna,

wherein said transmitting device further comprises a transmitting control unit operable to generate control information on number of the repetitive pulses included in each train of the n-piece repetitive pulse trains transmitted by said transmitting unit,

The transmitting device as defined in claim 4,

wherein said encoder outputs the n-bit encoded bit train in the form of an n-bit serial format encoded bit train, and

wherein said transmitting unit comprises:

a serial-to-parallel converter operable to convert the n-bit serial format encoded bit train outputted by said encoder to an n-bit parallel format encoded bit train,

a pulse generator operable to repetitively generate a plurality of pulses for each encoded bit of the n-bit parallel format encoded bit train outputted by said encoder, thereby outputting n-piece parallel format repetitive pulse trains, the plurality of pulses being predetermined according to a kind of each encoded bit; and

a parallel-to-serial converter operable to convert the n-piece parallel format repetitive pulse trains outputted by said pulse generator to n-piece serial format repetitive pulse trains, thereby sequentially transmitting the n-piece serial format repetitive pulse trains to the communication path,

wherein said pulse generator determines, in accordance with the control information generated by said transmitting control unit, the number of each repetitive pulses composing the n-piece repetitive pulse trains, in such a manner that pulses included in the n-piece repetitive pulse trains amount to $(k \cdot m)$ pieces in total, and at least two pieces of the n-piece repetitive pulse trains are composed of repetitive pulses of different numbers.

10. (Currently Amended) A transmitting device usable in an ultra-wideband communication system performing communications by sending repetitive pulse trains to a communication path, said transmitting device comprising:

an encoder operable to encode a k-bit information bit train to an n-bit encoded bit train at a coded rate of (k/n) (“k” is a natural number not less than 1, and “n” is a natural number not less than 2), on condition that m-piece pulses are transmitted per one bit of information bits (“m” is a natural number not less than 2) and the coded rate is (k/n) ; and

a transmitting unit operable to generate n-piece repetitive pulse trains based on the n-bit encoded bit train encoded by said encoder, thereby transmitting sequentially the n-piece repetitive pulse trains to the communication path,

wherein pulses included in the n-piece repetitive pulse trains transmitted by said transmitting unit amount to $(k \cdot m)$ pieces in total,

wherein the n-piece repetitive pulse trains are composed by performing, in accordance with a state of the communication path, weighting on a plurality of encoded bits, the weighting being performed such that, for each of the encoded bits, a number of repetitive pulses allotted to the encoded bit is based on the susceptibility of the encoded bit to an adverse effect including interference from another user, with an encoded bit that is susceptible to the adverse effect being allotted more repetitive pulses than an encoded bit that is not susceptible to the adverse effect, thereby adaptively adjusting the number of repetitive pulses of each of the n-piece repetitive pulse trains,

wherein the repetitive pulse trains themselves constitute radio waves transmitted from an antenna,

wherein said transmitting device further comprises a transmitting control unit operable to generate control information on number of the repetitive pulses included in each train of the n-piece repetitive pulse trains transmitted by said transmitting unit, and

The transmitting device as defined in claim 4,

wherein said transmitting unit comprises:

a bit train generator operable to repeat, for a plurality of times, each bit of the n-bit encoded bit train encoded by said encoder to generate n-piece repetitive bit trains; and

a pulse generator operable to generate a pulse for each bit of the n-piece repetitive bit trains generated by said bit train generator, the pulse being predetermined according to a kind of each bit, thereby transmitting the generated pulse to the communication path,

wherein said bit train generator determines, in accordance with the control information generated by said transmitting control unit, the number of each repetitive bits composing the n-piece repetitive bit trains, in such a manner that bits included in the n-piece repetitive bit trains amount to $(k*m)$ pieces in total, and at least two pieces of the n-piece repetitive bit trains are composed of repetitive bits of different numbers.

11. (Original) The transmitting device as defined in claim 10, wherein said transmitting control unit is operable to transmit, as bit train information, the number of repetitive bits of the n-piece repetitive bit trains generated by said bit train generator.

12-14. (Canceled)